Abstract Title Page
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Title: Preschool Center Quality and School Readiness: Quality Main Effects and Variation by Demographic and Child Characteristics

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Abstract Body *(updated 12/15/2010)*

Limit 5 pages single spaced.

Background / Context:

Approximately seventy-five percent of U.S. children currently experience routine non-parental care (e.g. preschool) before they enter kindergarten (U.S. Census Bureau, 2006). Both federal and state governments view high quality child care as a means to improve school readiness skills for children from economically disadvantaged families. High quality child care is viewed by parents and policy makers as a means to promote academic and social skills prior to entry to formal education based on strong evidence from experimental studies and modest, but relatively consistent evidence from larger, more representative observational studies (Vandell, 2004; Pianta, Barnett, Burchinal, & Thornburg, 2009).

Child care quality is complex and multi-faceted, as is demonstrated by the many features of both structural quality (e.g. child-adult ratio, curriculum, and caregiver's education and training) and process quality (e.g. child's direct experience with caregiver, peers, and the child care environment) (Helburn & Howes, 1996). While researchers acknowledge that there is generally a relationship between structural and process quality, the literature also suggests that the static nature of structural quality indicates that although certain structural features of programs are necessary they are not sufficient for ensuring that children will be given high quality child care (Pianta, et al., 2009). Much evidence suggests that it is the elements of process quality which lead to desirable child outcomes (Burchinal, Peisner-Feinberg, Bryant, & Clifford, 2000; Mashburn et al., 2008). Our paper examines the relationship between process quality—specifically, observed preschool center quality measures in preschool settings—and cognitive and achievement school readiness outcomes at kindergarten entry.

Prior studies yield relatively modest associations between child care quality and cognitive and achievement outcomes (Camilli et al., 2010). Questions have been raised about why these associations tend to be so modest, suggesting that high quality care might have a larger effect for children deemed more vulnerable due to family demographics or the child's skill level at entry to care. The evidence has been mixed when examined in individual studies; however, most of these studies do not include the full range of child care quality or children from diverse backgrounds (Vandell, 2004). This raises questions about which subsets of children experience larger and smaller program impacts. Researchers have postulated several competing hypotheses about differential program effects. Two of these are especially relevant to children's participation in high-quality early education programs and specify who is expected to derive greater benefit from these high-quality programs. The *compensatory hypothesis* (Sameroff & Chandler, 1975) predicts that children who are at risk because of economic disadvantage, low skills, or difficult temperaments derive greater benefit from high-quality early education programs relative to children who are not at risk. This hypothesis provided the rationale for the funding of programs such as Head Start. Alternatively, the *accumulated advantages* hypothesis posits that children with greater initial individual abilities (*skill begets skill*) (Cunha, Heckman, Lochner and Masterov, 2006) or less-risky advantage-laden family environments (*accumulated advantages*) will derive greater benefits from high-quality early education programs than less advantaged peers because of their ability to build on existing skills or family advantage.

Purpose / Objective / Research Question / Focus of Study:
The aim of our paper is to address two research questions related to the policy goal of having all children ready to learn at kindergarten entry. First, to what extent are children's cognitive and achievement skills higher when they experience higher quality preschools? Second, are the effects of preschool center quality on these school readiness skills different by demographic (i.e. race/ethnicity, gender, maternal education) or child characteristics (i.e. child's initial cognitive/achievement skills, attention, problem behaviors)?

Research Hypotheses. Consistent with the literature outlined above, we hypothesize that there are positive preschool center quality main effects for both cognitive and achievement outcomes. In addition, we will test questions of moderation with quality and demographic and child characteristics. The first two moderators are the race/ethnicity and gender of the child. For the other moderators of interest in our study, we hypothesize that, in accordance with the *compensatory hypothesis*, children benefit more from high-quality early child care programs if their mothers had a high school or less than high school education or if they enter preschool with moderately low cognitive/achievement skills, low attention skills, or more behavior problems. While testing this hypothesis, we will be examining two-tailed tests so we are simultaneously examining the *accumulated advantages hypothesis* that the opposite is true – the effects of high-quality preschool programs are weakest for high-risk children.

Setting:
All data included in these secondary data analyses were collected in preschool center-based care.

Population / Participants / Subjects:
The section below and Table 1 provide an overview of the four databases in the study.

(please insert Table 1 here)

NICHD Study of Early Child care and Youth Development (SECCYD). Nonexperimental longitudinal data from the NICHD SECCYD are drawn from a multisite study of births in 1991. Although not nationally representative, the study sample (n=1,364) closely matches national and census tract records with respect to demographic variables. Assessments includes demographic and parental characteristics; quality of parenting; type, amount, and quality of child care; and children's social, language, cognitive, and academic skills.

Early Childhood Longitudinal Study – Birth Cohort (ECLS-B). The ECLS-B has followed a large, nationally representative sample of children born in 2001 to kindergarten entry. The ECLS-B provides detailed information on children's development, health, and learning experiences during the years leading up to school. The base year sample includes about 10,700 infants during the 9-month data collection wave. Data collection ended during the school year in which the child attended kindergarten, with an approximate completed sample size of 8,000.

National Center for Early Development and Learning (NCEDL). The NCEDL followed 2,983 children enrolled in 721 pre-K classrooms randomly chosen within selected regions of eleven states with mature pre-K programs**.** These eleven states served approximately 80% of children in the U.S. who attend state pre-K programs in the study years of 2001-2003. Children and their classroom experiences were assessed in the fall and spring of the pre-K year for all children and

in the fall and spring of the kindergarten year for the first cohort of children.

Early Head Start (EHS). Our final database comes from the evaluation of the EHS program. In 1996, 3,001 children under one year of age from low income families from seventeen sites were randomly assigned to receive EHS services, or to a control group. Data included direct assessments of the children, laboratory tasks, maternal report interviews and questionnaires, and observations of the quality of the home and child care environments.

Measures

Table 2 describes the key dependent and independent variables in our analyses along with their Cronbach's alphas. Table 3 lists descriptive statistics of the variables of interest in each of the databases. The primary measures of interest for each of the four studies are described below.

(please insert Table 2 here)

(please insert Table 3 here)

Outcome Measures

Cognitive/language skills. The Peabody Picture Vocabulary Test, 3rd edition (PPVT-III) (Dunn & Dunn, 1997), used in the NCEDL and EHS studies, is an achievement test of receptive vocabulary that relates to other measures of language, literacy, and academic achievement. The Preschool Language Scale-3 (PLS-3; Zimmerman, Steiner, & Pond, 1992), used in the NICHD SECCYD, measures a range of language behaviors, including vocabulary, morphology, syntax, and integrative thinking. A composite of the PPVT and other measures were used in the ECLS-B.

Achievement/mathematics skills. The NCEDL and EHS studies administered the Woodcock-Johnson (WJ) III Applied Problems Subtest (Woodcock, McGrew, & Mather, 2001) to measure early math skills. This subtest examines the child's ability to analyze and solve math problems. The NICHD SECCYD study used the Woodcock-Johnson Revised (Woodcock & Johnson, 1989) measure. The ECLS-B used a composite measure of mathematics, developed by Educational Testing Service. These measures draw on items from major achievement and language tests including the Woodcock-Johnson.

Child Care Quality Measures

For this study, we chose child care quality measures that assess practices thought to improve children's cognitive and academic achievement skills; these include two global quality measures and a measure of instructional quality. The **Early Childhood Environment Rating Scale-Revised (ECERS-R)** (Harms, Clifford, & Cryer, 1998)—used in the ECLS-B, NCEDL, and EHS databases—is a widely used measure of global classroom quality. The **Observational Record of the Caregiving Environment (ORCE)** was designed specifically for the NICHD SECCYD to assess the quality of caregiver-child interaction experienced by individual children. Finally, the NCEDL also used the **Classroom Assessment Scoring System (CLASS)** (Pianta, La Paro, & Hamre, 2008), which is an observational assessment to rate teacher-child interactions on nine dimensions of the socioemotional and instructional climate of the classroom. We use the *CLASS Instructional Climate* subscale in the current analyses.

Baseline Child Characteristics

Cognitive and achievement skills. The PPVT-III or the PPVT-Revised (Dunn & Dunn, 1981) was administered at entry to or during preschool in the ECLS-B, NCEDL, and EHS studies (see previous section for measure description). The Bayley Scales of Infant Development (BSID-II; Bayley, 1993; SECCYD, ECLS-B, EHS) was administered at 24 months to assess general cognitive development. Only the NCEDL database measured achievement at baseline using the Woodcock-Johnson (WJ) III Applied Problems Subtest to measure early math skills.

Attention skills. The Child Behavior Checklist (CBCL) (Achenbach, 1991) was used in the NICHD SECCYD and EHS study and includes an attention subscale measured at 24 months (NICHD SECCYD) and 36 months (EHS). The ECLS-B included attention ratings from the Bayley Infant Behavior Record (IBR) at 24 months. The Teacher-Child Rating Scale (TCRS) Task Orientation subscale (Hightower et al., 1986) was used in the NCEDL study.

Problem behaviors. We specifically examined externalizing problem behaviors. Of the four databases, only the NICHD SECCYD and NCEDL had well-defined externalizing problem behaviors measures to include in the analysis. For the NICHD SECCYD, the Child Behavior Checklist (CBCL) (Achenbach, 1991) externalizing behavior subscale at 36 months was included in the analyses. For the NCEDL study, the Hightower Teacher-Child Rating Scale Conduct Problems subscale was used.

Control Variables. Where available, our covariates include: baseline cognitive and achievement skills, child age, low birth weight, maternal characteristics (such as depression and sensitivity), parenting quality, household structure, and family income. Our general rationale for selecting covariates was to include as many possible characteristics that could account for selection bias by including variables that came before the measurement of the outcome variables.

Research Design:
Our secondary data analysis involves conducting parallel analyses predicting school readiness skills from preschool center quality across four large databases and then combining the results using meta-analysis. The four databases analyzed in the study were selected because they were large child care databases with both preschool center quality and child outcome measures.

Data Collection and Analysis:
For each database, we estimated change models in which changes in child cognitive skills or achievement are regressed on average child care quality in between the outcome measurements, plus controls. Our school readiness outcomes are language/cognitive and math/achievement skills at kindergarten entry. Our predictors include observed child care quality and interactions between quality and demographic characteristics on one set of analyses and the child characteristics of baseline cognitive/achievement, attention, and problem behaviors on another set of analyses. We then combined coefficients for quality main effects and interactions in a formal meta-analysis using the Comprehensive Meta-Analysis (CMA) software (Borenstein, Hedges, Higgins, & Rothstein, 2009).

Findings / Results:
The results from our meta-analysis of four large databases indicate statistically significant, albeit

modest, preschool center quality main effects on children's cognitive and achievement skills at kindergarten entry (both outcomes, B=.03, p<.001) and little consistent evidence supporting differential effects for demographic and child characteristics (quality x gender: male, B=.03, p<.01; quality x maternal education: BA plus, B=.05, p<.05). This is consistent with prior studies finding that all children benefit from high-quality preschool programs, although the magnitude of effects is modest. Differential preschool program effects across groups defined by gender, ethnicity, or poverty are not consistently found in the literature (Pianta et al., 2009). Table 4 lists results for the four individual databases and the meta-analytic averages for preschool center quality main effects and interactions for both cognitive and achievement outcomes. Figures 1, 2, and 3 illustrate the results of our meta-analysis in graphical format.

(please insert Table 4 here)
(please insert Figures 1, 2, & 3 here)

We can think of several possible reasons for these results. First, differences in the normal range of preschool center quality may not matter as much for school readiness. Human development is multi-faceted, thus it is unreasonable to expect child care quality effects to be large (Lamb & Ahnert, 2006). Child care quality matters but maybe not as much as previous researchers and policymakers had hoped. Second, some of the earlier work on child care quality has suggested bigger quality effects while the more recent work on quality effects (NICHD ECCRN & Duncan, 2003) is more similar to our findings because the earlier studies did not control for selection bias as well as later studies did (Vandell, 2004). Finally, there is the possibility that preschool center quality may not be adequately measured in currently available databases (Burchinal, Kainz, & Cai, in press; Zaslow, et al., 2006). All of the present quality measures were developed conceptually by child development experts without the much needed psychometric analysis of the child care quality instruments. On the whole, our findings are consistent with other recent studies suggesting that currently available quality measures are not adequate to the research tasks being undertaken (Burchinal et al., in press; Zaslow, et al., 2006).

Conclusions:
While policymakers attach considerable weight to experimental evaluations of child care programs, there is much to be learned from rigorous analyses of longitudinal data that are more representative of the population. Our paper applies meta-analytic techniques to summarize results from original analyses of four longitudinal databases to estimate variation in preschool program quality impacts by demographic and child characteristics. The consistency of our generally null results and the precision with which they are estimated across the four databases, multiple outcomes, and multiple child care quality measures suggests the following: (1) there are at best very modest preschool center quality main effects on both cognitive and achievement child outcomes and (2) there is generally an absence of *differential* preschool center quality effects on school readiness for subgroups of children defined by demographic or child characteristics. However, readers should bear in mind that preschool center quality may not be adequately measured in currently available databases.

Appendices
Not included in page count.

Appendix A. References

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Appendix B. Tables and Figures

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Table 1. Descriptions of the four databases

	NICHD SECCYD	ECLS-B	NCEDL 11-state	EHS
Sample				
All children in center care	733	5399	2982	609
Children with observed child care quality scores	670	1429[A]	2982	241
Number of classrooms	623	1429	721	241
Year quality & post-test collected	1995-1996	2005-2006	2001 for Multi-State Study of Pre-K and 2004 for SWEEP[B]	2001-2003 (three cohorts)
Population analysis sample represents	Children at the 10 locations across the U.S. who were in center-based care the year before pre-k.	A nationally representative sample of children born in 2001 who were in center care at 4 years of age	State funded pre-K classrooms and children in 11 participating states	Children who had been in EHS Evaluation Study as infants or toddlers
Percent Head Start Classroom (%)	9	22	15	45
Percent in state pre-K (%)	n/a	19	100	n/a
Percent housed in public schools (%)	n/a	25	62	n/a
Mean child (SD) age (months) at baseline assessment	37.68 (0.75)	24.48 (1.32)	55.56 (3.84)	37.10 (1.41)
Mean child (SD) age (months) at outcome assessment	56.86 (1.11)	53.16 (4.08)	60.60 (3.84)	62.36 (3.84)

Note: NICHD SECCYD= National Institute of Child Health and Human Development-Study of Early Child Care and Youth Development; ECLS-B=Early Childhood Longitudinal Study – Birth Cohort; NCEDL=National Center for Early Development and Learning; EHS=Early Head Start.

[A] A random subset of the ECLS-B sample had child care settings evaluated.

[B] SWEEP=State-Wide Early Education Programs

Table 2. Key Dependent/Independent Variables

	NICHD SECCYD	ECLS-B	NCEDL 11-state	EHS
Outcomes				
Cognitive/Language	Preschool Language Scale-3 (54 months) (α = .89-.92)	ECLS-B literacy (composite of PPVT & other measures) (48 months) (α = .91)	Peabody Picture Vocabulary Test (PPVT-III) (spring pre-K) (α = .92-.98)	Peabody Picture Vocabulary Test (PPVT-III) (63 months) (α = .92-.98)
Achievement/Mathematics	Woodcock-Johnson-R applied problems (54 months) (α = .91)	ECLS-B Math (Math ECLS-K developed measures) (48 months) (α = .89)	Woodcock-Johnson III applied problems (spring pre-K) (α = .92-.94)	Woodcock-Johnson III applied problems (63 months) (α = .92-.94)
Preschool Center Quality	Observational Record of the Caregiving Environment (ORCE) (36, 54 months) (α = .80-.90)	Early Childhood Environment Rating Scale-Revised (ECERS-R composite) (48 months) (α = .92)	Early Childhood Environment Rating Scale-Revised (ECERS-R composite) (α = .92) & Classroom Assessment Scoring System, Factor 2: Instructional Climate (CLASS F2) (α = .83) (pre-K)	Early Childhood Environment Rating Scale-Revised (ECERS-R composite) (48 months) (α = .92)
Baseline Child Characteristics				
Cognitive/Language & Achievement/Mathematics	Bayley (24 months) (α = .83)	BSID-SF (a modified version of the Bayley) (24 months) (α = .80)	Peabody Picture Vocabulary Test (PPVT-III) (α = .92-.98) & Woodcock-Johnson III applied problems (both at fall pre-K) (α = .92-.94)	Bayley (36 months) (α = .83)
Attention	Attention subscale from Child Behavior Checklist (CBCL) (24 months)	Attention rating from Bayley Infant Behavior Record (IBR) (24 months)	Hightower's Teacher-Child Rating Scale task orientation subscale (fall pre-K) (α = .95)	Child sustained attention to objects during Three Bags mother-child interaction (36 months)
Problem Behavior	Child Behavior Checklist (CBCL) externalizing behavior only (36 months) (α = .86)	n/a	Hightower's Teacher-Child Rating Scale conduct problems subscale (fall pre-K) (α = .91)	n/a

Note: NICHD SECCYD= National Institute of Child Health and Human Development-Study of Early Child Care and Youth Development; ECLS-B=Early Childhood Longitudinal Study – Birth Cohort; NCEDL=National Center for Early Development and Learning; EHS=Early Head Start. All reliability coefficients (alphas) are from the measure's authors.

Table 3. Descriptive statistics *(continued on next page)*

	NICHD SECCYD (only center care)			ECLS-B (only center care)			NCEDL 11-state (study is all center care)			EHS (only center care)		
Child-level	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Outcomes												
Preschool Language Scale	690	101.78	17.84	--	--	--	--	--	--	--	--	--
Composite of PPVT & other measures	--	--	--	5000	8.73	1.95	--	--	--	--	--	--
Peabody Picture Vocab Test (PPVT-III)	--	--	--	--	--	--	2298	52.25	18.20	410	90.21	14.80
Woodcock-Johnson III applied problems	690	104.61	15.21	--	--	--	2273	99.11	12.85	417	88.94	17.99
Math ECLS-K developed measures	--	--	--	4900	23.48	7.05	--	--	--	--	--	--
Baseline Child Characteristics												
Cognitive/Language	708	93.60	14.38	4900	126.61	10.84	2298	52.25	18.20	389	88.29	12.54
Achievement/Mathematics	--	--	--	--	--	--	2273	98.42	13.66	--	--	--
Attention	710	2.99	0.66	4800	13.79	3.68	2566	3.52	0.94	407	4.90	0.93
Problem Behavior	402	26.65	18.83	--	--	--	2571	1.51	0.53	--	--	--
Classroom-level	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Observed process quality												
ORCE (36 months)	244	2.74	0.44	--	--	--	--	--	--	--	--	--
ORCE (54 months)	670	3.04	0.55	--	--	--	--	--	--	--	--	--
ECERS-R composite	--	--	--	1400	4.53	1.07	705	3.84	0.82	241	4.86	1.25
CLASS Factor 2: Instructional Climate	--	--	--	--	--	--	694	2.06	0.84	--	--	--
Demographics	N	Mean		N	Mean		N	Mean		N	Mean	
Ethnicity Total N	733			5100			2898			609		
White		0.80			0.56			0.41			0.29	
Black		0.11			0.15			0.18			0.38	
Hispanic		0.05			0.22			0.26			0.26	
Asian[A]		--			0.03			--			--	
Other (not Black, Hispanic, White)		0.04			0.04			0.14			0.06	
Gender Total N	733			5100			2966			609		
Male		0.50			0.52			0.49			0.52	
Mother's Education Total N	733			5000			2885			609		
Mom Ed: 12 Years or Less		0.24			0.39			0.59			0.51	
Mom Ed: Some College		0.57			0.29			0.23			0.20	
Mom Ed: BA Plus		0.19			0.32			0.18			0.29	

Note: NICHD SECCYD= National Institute of Child Health and Human Development-Study of Early Child Care and Youth Development; ECLS-B=Early Childhood Longitudinal Study – Birth Cohort; NCEDL=National Center for Early Development and Learning; EHS=Early Head Start; ECLS-B weight W31C0 was used for all ECLS-B variables except for the ECERS-R composite mean and sd, which was weighted by W33P0. All Ns for the ECLS-B are rounded to the nearest 50 per NCES/IES reporting requirements.

[A] Asian category only in ECLS-B (the other three databases include Asians in Other category)

Table 3. Descriptive statistics *(continued from previous page)*

	NICHD SECCYD (only center care)			ECLS-B (only center care)			NCEDL 11-state (study is all center care)			EHS (only center care)		
Child-level	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Other Controls in NICHD SECCYD												
Center care proportion @ 27-54 month	733	0.46	0.35	--	--	--	--	--	--	--	--	--
Exclusive maternal care @ 27-54 month	733	0.00	0.06	--	--	--	--	--	--	--	--	--
Mom's partner live in home @ 27-54 month	733	0.79	0.41	--	--	--	--	--	--	--	--	--
Income-to-needs ratio @ 27-54 month	698	4.10	3.21	--	--	--	--	--	--	--	--	--
Maternal depression @ 27-54 month	697	9.09	7.08	--	--	--	--	--	--	--	--	--
Maternal sensitivity @ 27-54 month	669	17.37	2.36	--	--	--	--	--	--	--	--	--
Maternal agreement @ 6 month	719	46.51	5.20	--	--	--	--	--	--	--	--	--
Maternal neutralism @ 6 month	719	29.55	7.06	--	--	--	--	--	--	--	--	--
Maternal Extrvm @ 6 month	719	42.72	5.82	--	--	--	--	--	--	--	--	--
Maternal progressive attitudes for rearing child	730	33.12	3.46	--	--	--	--	--	--	--	--	--
Maternal benefit from work	733	19.21	3.09	--	--	--	--	--	--	--	--	--
H.O.M.E. score @ 27-54 month	676	44.66	5.60	--	--	--	--	--	--	--	--	--
Other Controls in ECLS-B												
Age in years at baseline assessment	--	--	--	5050	4.40	0.33	--	--	--	--	--	--
Dummy: Exclusive Maternal Care 9 mos	--	--	--	5100	0.50	--	--	--	--	--	--	--
Dummy: Exclusive Maternal Care 24 mos	--	--	--	5100	0.49	--	--	--	--	--	--	--
Hours Center Care Per Day 9 mos	--	--	--	5100	0.55	1.73	--	--	--	--	--	--
Hours Center Care Per Day 24 mos	--	--	--	5100	1.03	2.19	--	--	--	--	--	--
Hours Center Care Per Day 48 mos	--	--	--	5100	4.41	2.04	--	--	--	--	--	--
Maternal Sensitivity 9 mos (NCATS)	--	--	--	4458	34.63	4.54	--	--	--	--	--	--
Dummy: Low Birth Weight	--	--	--	5100	0.06	--	--	--	--	--	--	--
Dummy: Very Low Birth Weight	--	--	--	5100	0.01	--	--	--	--	--	--	--
Other Controls in NCEDL												
Age in years at baseline assessment	--	--	--	--	--	--	2700	4.63	0.32	--	--	--
Family income at or below 150% of poverty (0=no, 1=yes)	--	--	--	--	--	--	2750	0.58	0.49	--	--	--
Number of people in household	--	--	--	--	--	--	2894	4.45	1.44	--	--	--
Household--grandma present (0=no, 1=yes)	--	--	--	--	--	--	2906	0.12	0.32	--	--	--
Household--father present (0=no, 1=yes)	--	--	--	--	--	--	2906	0.62	0.49	--	--	--
Household--step-father present (0=no, 1=yes)	--	--	--	--	--	--	2906	0.06	0.23	--	--	--
Other Controls in EHS												
Program group? (0=comparison, 1=program)	--	--	--	--	--	--	--	--	--	608	0.50	0.50
Primary language is English (0=no, 1=yes)	--	--	--	--	--	--	--	--	--	603	0.83	0.38
Dummy: Poverty-level1 = less than 33%	--	--	--	--	--	--	--	--	--	609	0.23	0.42
Dummy: Poverty-level2 = 33% - 67%	--	--	--	--	--	--	--	--	--	609	0.22	0.42
Dummy: Poverty-level3 = 67% - 99%	--	--	--	--	--	--	--	--	--	609	0.19	0.40
Dummy: Poverty-level4 = 100% or more	--	--	--	--	--	--	--	--	--	609	0.13	0.33
Teenage mom (0=no, 1=yes)	--	--	--	--	--	--	--	--	--	594	0.41	0.49
Mom's partner live in home (0=no, 1=yes)	--	--	--	--	--	--	--	--	--	609	0.62	0.49
H.O.M.E. score	--	--	--	--	--	--	--	--	--	386	34.21	5.60

Note: NICHD SECCYD= National Institute of Child Health and Human Development-Study of Early Child Care and Youth Development; ECLS-B=Early Childhood Longitudinal Study – Birth Cohort; NCEDL=National Center for Early Development and Learning; EHS=Early Head Start; ECLS-B weight W31C0 was used for all ECLS-B variables except for the ECERS-R composite mean and sd, which was weighted by W33P0. All Ns for the ECLS-B are rounded to the nearest 50 per NCES/IES reporting requirements.

[A] Asian category only in ECLS-B (the other three databases include Asians in Other category)

Table 4. Standardized Coefficients and Meta-analytic Averages for Preschool Center Quality Main Effects and Interactions for Cognitive and Achievement Outcomes

Outcome=Cognitive

	NICHD SECCYD		ECLS-B		NCEDL				EHS		Meta-analytic Average	
	ORCE		ECERS		ECERS		CLASS F2		ECERS			
Quality (Q) Main Effect	0.04	(0.04)	0.05**	(0.02)	0.02*	(0.01)	0.06***	(0.02)	-0.07	(0.05)	0.03***	(0.01)
Q x Black	-0.25*	(0.13)	-0.01	(0.06)	0.00	(0.03)	0.01	(0.04)	0.02	(0.10)	-0.01	(0.02)
Q x Hispanic	-0.23	(0.28)	0.02	(0.08)	-0.06	(0.04)	0.05	(0.03)	-0.08	(0.12)	0.01	(0.02)
Q x Other R/E	0.01	(0.15)	--	--	0.03	(0.04)	0.01	(0.03)	-0.12	(0.27)	0.01	(0.02)
Q x Male	0.04	(0.07)	0.07	(0.05)	0.04*	(0.02)	0.01	(0.02)	0.09	(0.09)	0.03**	(0.01)
Q x Some College	0.09	(0.08)	-0.02	(0.04)	0.05	(0.03)	0.01	(0.03)	-0.02	(0.12)	0.02	(0.02)
Q x BA Plus	0.06	(0.12)	0.16***	(0.05)	0.06*	(0.03)	0.00	(0.03)	-0.18	(0.15)	0.05*	(0.02)
Q x Lowest 25% Lagged DV	0.24**	(0.09)	-0.01	(0.03)	-0.03	(0.03)	0.03	(0.03)	0.02	(0.10)	0.00	(0.02)
Q x Lowest 25% Attention	0.02	(0.08)	-0.02	(0.04)	-0.03	(0.03)	-0.02	(0.04)	0.02	(0.09)	-0.02	(0.02)
Q x Lowest 25% Problem Behavior	0.17*	(0.07)	--	--	0.01	(0.03)	0.01	(0.03)	--	--	0.02	(0.02)

Outcome=Achievement

	NICHD SECCYD		ECLS-B		NCEDL				EHS		Meta-analytic Average	
	ORCE		ECERS		ECERS		CLASS F2		ECERS			
Quality (Q) Main Effect	0.06	(0.04)	-0.02	(0.03)	0.01	(0.02)	0.08***	(0.02)	0.01	(0.06)	0.03***	(0.01)
Q x Black	-0.17	(0.13)	-0.01	(0.05)	0.04	(0.04)	0.05	(0.04)	-0.01	(0.10)	0.02	(0.02)
Q x Hispanic	-0.36	(0.29)	-0.03	(0.06)	0.00	(0.06)	0.16**	(0.06)	-0.17	(0.15)	0.04	(0.03)
Q x Other R/E	-0.26	(0.23)	--	--	-0.02	(0.04)	0.06	(0.04)	-0.18	(0.29)	0.01	(0.03)
Q x Male	0.07	(0.08)	0.06	(0.05)	0.01	(0.03)	0.01	(0.03)	-0.05	(0.09)	0.02	(0.02)
Q x Some College	0.17	(0.09)	-0.05	(0.04)	-0.07	(0.04)	-0.02	(0.04)	0.00	(0.09)	-0.03	(0.02)
Q x BA Plus	0.03	(0.13)	0.09*	(0.04)	0.00	(0.04)	-0.06	(0.04)	-0.22	(0.16)	0.00	(0.02)
Q x Lowest 25% Lagged DV	0.38***	(0.10)	0.00	(0.04)	-0.05	(0.03)	0.03	(0.04)	-0.03	(0.10)	0.00	(0.02)
Q x Lowest 25% Attention	0.06	(0.12)	-0.03	(0.04)	0.01	(0.03)	0.00	(0.04)	-0.05	(0.10)	0.00	(0.02)
Q x Lowest 25% Problem Behavior	0.11	(0.08)	--	--	0.02	(0.03)	-0.06	(0.04)	--	--	0.00	(0.02)

Note: B(se); *p < .05. **p < .01. ***p < .001.; NICHD SECCYD= National Institute of Child Health and Human Development-Study of Early Child Care and Youth Development; ECLS-B=Early Childhood Longitudinal Study – Birth Cohort; NCEDL=National Center for Early Development and Learning; EHS=Early Head Start; ORCE=Observational Record of the Caregiving Environment; ECERS-R=Early Childhood Environment Rating Scale-Revised; CLASS F2=Classroom Assessment Scoring System, Factor 2 is Instructional Climate.

Figure 1. Standardized Coefficients for Preschool Center Quality Main Effects for *Cognitive* & *Achievement Outcomes* estimated from four databases. Filled squares and triangles indicate statistically significant coefficients.

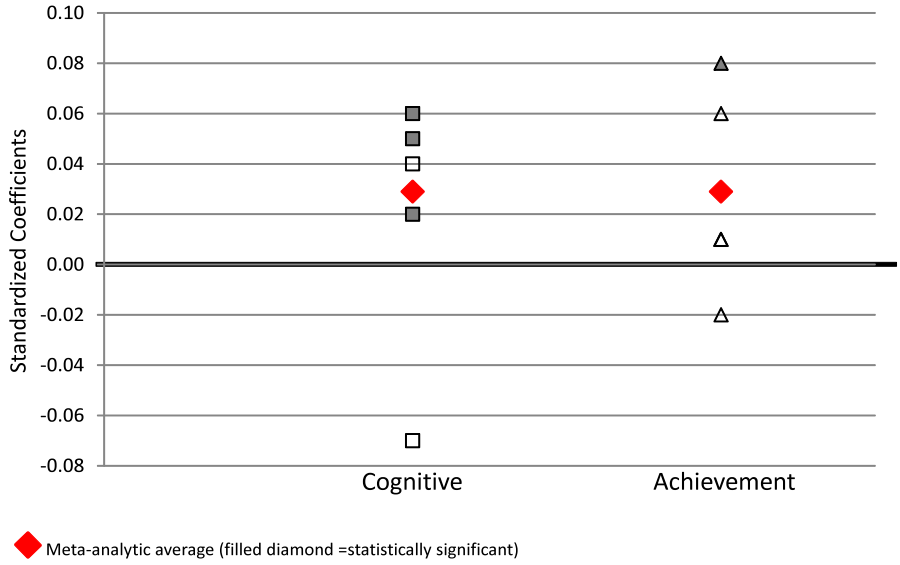

Figure 2. Standardized Coefficients for Preschool Center Quality Interactions for *Cognitive Outcomes* estimated from four databases. Filled squares indicate statistically significant coefficients.

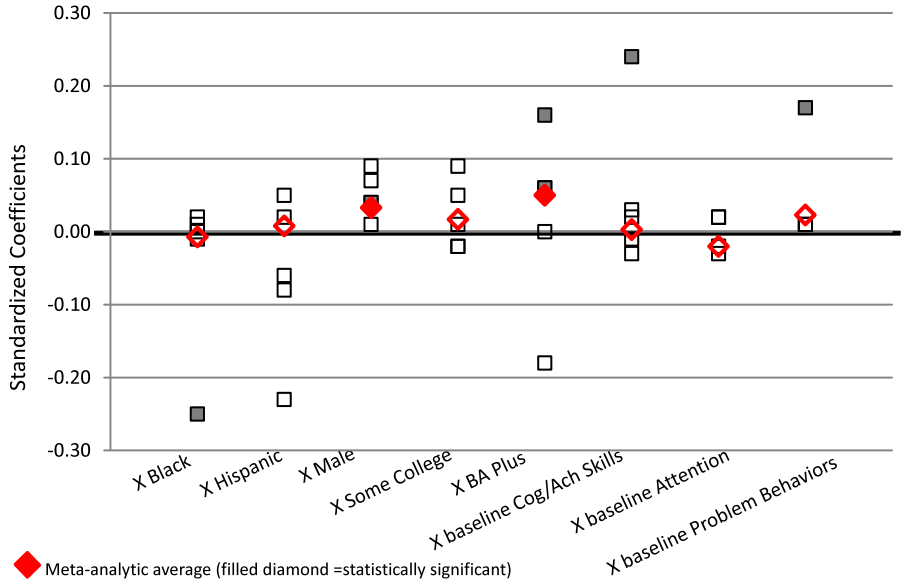

Figure 3. Standardized Coefficients for Preschool Center Quality Interactions for *Achievement Outcomes* estimated from four databases. Filled triangles indicate statistically significant coefficients.